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ABSTRACT

This is one of a series of units for environmental education developed by the Highline Public Schools. This unit was written for seventh-grade students in anthropology. The six lessons and suggested activities will take from 15 to 30 days to complete. Each lesson includes the concept of the lesson, materials needed, notes to the teacher, procedure, evaluative activities, and suggested additional activities. The materials were tried and evaluated; evaluation data may be obtained from the Highline Public Schools. (RH)

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PAK

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by Kathie Muccilli

An Environmental Learning Experience for 7th grade level. One of many "ELE PAKS" available for all areas.

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SE 021 476

NATURE KNOWS BEST

PROJECT ECOLOGY TITLE III

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Evaluation Results Regarding This ELE May Be Obtained by Including This Page and a Self-Addressed Stamped Envelope To

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EVERYTHING IS CONNECTED TO EVERYTHING ELSE

PROJECT ECOLOGY

THERE IS NO SUCH THING AS A FREE LUNCH

PROJECT ECOLOGY TITLE III

EVERYTHING MUST GO SOME WHERE

PROJECT ECOLOGY • TITLE III

ARCHAEOLOGY/ECOLOGY PAK

CONCEPTS

1. Understanding what "Archaeology" is.
2. Man, as well as nature, is subject to natural process that allow his remains to be found.
3. Man is interdependent with his environment.
4. The deterioration of man-made objects is unstable.
5. Man and his cultural things are at the mercy of time, as are all parts of the environment.
6. One can analyze an object by determining what age it is.
7. Over a period of time places change.
8. One's culture determines one's view of nature.

NOTES TO THE TEACHER

This PAK was written for 7th grade students in Anthropology. An overview and introduction to the school environment should proceed this PAK (See Ecology Walk PAK) as well as a unit on Early Man. It is hoped that a continuous re-inforcement of ecological principles and individual action tasks will be emphasized throughout the year. The "Archaeology" handout is a six (6) page encyclopedic selection from World Book Encyclopedia. Another selection could be substituted for it.

Master copies of handouts, charts and quizzes are enclosed. (See Master Materials List)

The suggested extra activities are presented in order to give students a more in-depth study of present day ecological problems.

APPROXIMATE TIME PERIOD

	Moderate coverage	Thorough coverage
Without suggested extra activities	- 15 days	30-40 days
With suggested extra activities	- 15-25 days	40-50 days

STUDENT NOTEBOOKS

Students should keep a loose leaf and spiral notebook for handouts and notes. The student should keep a list of the vocabulary introduced in each lesson. The spiral notebook is recommended for this purpose. (See Suggested Vocabulary Activity at conclusion of PAK).

MASTER MATERIALS LIST

Note to Teacher: Masters, notes and test are included at the end of the PAK

Archaeology handout (master enclosed, 6 pages)

Overhead Projector

Make transparencies of Archaeology handout

Film and film projector (see lesson plans for recommendations)

Filmstrip projector and record player

Lesson 1: "Concepts of Archaeology" - 2 filmstrips and 2 rec/cas.
Educational Dimensions
$41/$45

Lesson 2: "Beer Can on the Highway" - 1 filmstrip with disc or cassette
Schloat Prod. - 1972
$23/$26

Books and magazines from school library. (See Bibliography for recommended titles)

Clay pot(s) broken into pieces

Present day artifact pile (See things to do before unit)

Pictures of one area at school (See things to do before unit)

Textbook: "Man and His World"
Contemporary Social Studies Curriculum
Silver Burdett Company, 1972

"Early Man"
Life-Time Books
New York, 1965

"Things of Science" (See Lesson 2: Suggested Extra Activities)

"Ancient Egypt" (color transparency book) Milliken Publishing Co., St. Louis, MO.
price $3.25 (Use for Lesson 3)

Masters: Archaeology Handout (6 pages)
Present Day Artifact Chart
Decomposition Chart
Quiz over Archaeology Handout
"Why are so Many on an Archaeological Dig?"
Tutankhamen's Tomb
Questions over King Tut (page 3)
Questions for pages 4, 5 and 6
Notes over Ancient Egypt
Notes on Dating Methods

Masters: Chart of views of nature
(cont.) American Indian attitudes
Pictures of Tut's Tomb

Tree Ring Samples

Slides: Make a set of slides out of books recommended from reference books listed in Lessons 2, 3, 4

Other: Notes: Notes For The Teacher (Lesson 3)

Tests: Review; final test; quiz

Other: Bulletin board space
Blackboard
Colored paper
Butcher paper
Felt pens

THINGS TO DO BEFORE UNIT

THREE-SIX MONTHS BEFORE

1. Present Day Artifact Pile:

   Container: Make a box, open on the top, three sides with wood (plywood), one side with heavy plastic. Container can be large or small depending on your preference. Use plywood and plastic/glass.
   Back and front - 46" wide, 46" long
   Sides - 16½" wide, 46" long

   Collect: large quantities of each item.
   items of glass - 1 layer
   items of plastic - 1 layer
   items of aluminum - ½ layer
   items of steel - ½ layer
   items of wood - 1 layer
   items of wax - ¼ layer
   items of fiber - ¼ layer
   items of paper - 1 layer
   Items of live plant - 1 layer
   items of clay or pottery - ¼ layer
   items of bone - ¼ layer

   Make thick layers of each item and put dirt between each layer. Place box near a window so it is visible to class. Allow rain to fall on to it to increase break-down of materials.

2. Take pictures of school grounds
   1. playfield
   2. corridors
   3. outside sidewalks
   4. front of school
   5. cafeteria before, after lunch
   6. outside area - in summer, spring, winter, fall and during different weather conditions

   Develop and save pictures

3. Purchase "Things of Science" (suggested extra activities, Lesson 2) See Lesson 2 for details.

ONE MONTH BEFORE

4. Make slides out of pictures from books Lesson 2, 3, 4

LESSON

PLANS

LESSON 1

CONCEPT: Understanding what "Archaeology" is.

MATERIALS:
Handout: "Study of Archaeology", page 1 (class set)
Teacher transparency of page 1
"Concepts of Archaeology" - filmstrip and record (Educational Dimensions)

PROCEDURE:

1. Ask students to define Archaeology.

   Have students read their definitions and discuss.

2. Pass out handout, page 1, "The Science of Digging up the Past".

3. Have them read it and underline the main ideas.

4. Go over this as a class. Teacher should underline transparency copy as students underline own copy.

5. Show students filmstrip "Concepts of Archaeology" and discuss.

EVALUATIVE ACTIVITY:

1. Have students re-write their definition of Archaeology in their spiral notebooks.

2. Have students complete ditto - "Why are so many on an Archaeological Dig"?

3. Discuss this handout.

EXTRA ACTIVITIES:

1. Show film "Digging Up the Past" - available at ERAC - or comparable film that shows archaeological dig. Alternate film would be "The Silent Ones".

2. Discuss film and quiz students over main points.

LESSON 2

CONCEPT: Man, as well as nature, is subject to natural processes that allow his remains to be found.

MATERIALS:
Page 2 of handout (class set)
Page 2, teacher transparency
Overhead projector
Book: Early Man (Life-Time) - Multiple copies if available
Present Day Artifact Chart

PROCEDURE:

1. Distribute page 2 to students. Have them read and underline main points.

2. Teacher should underline main points on transparency.

3. Have students define and write vocabulary in spirals:
   - Stratification
   - Potsherds
   - Typology
   - Artifact

4. Early Man Book - Techniques of Field Work (make slides out of these pictures)

   Page 22 and 23
   Discuss
   1. Role of amateur in Archaeology

   2. What effect the amateur would have today?

   3. Compare amateur with professional archaeologist from Lesson 1

   Page 76, 138
   1. Discuss stratification

   Page 86-89 or pages 136-139
   1. Note how excavation looks

   2. Detail necessary for cataloging evidence

   Ask Students:

   3. Why is all this necessary?

   Pages 164-165
   1. What type of remains are usually found at sites?

   2. Why are they found while others like remains of food or plants are not?

5. The Importance of Pottery

   a. Teacher should provide broken up flower pots and have students try to re-assemble it. Have them label pieces as they put it together. Use several pots - divide the class into groups for this activity.

EVALUATIVE ACTIVITY:

1. Give students a list of items that are found in the Present Day Artifact Pile and what they are made of.

2. Give them a copy of chart and have them predict the life span of each item.

   (NOTE: enclosed table for the exercise. (Master))

3. Directions to students:
   1. List all items and tell what it is made of.
   2. Check only one time category for each item.

SUGGESTED EXTRA ACTIVITIES:

1. Show film - "Trouble With Trash" or "Garbage" show the problems resulting from the increase of solid wastes and what approaches exist for disposal. (available ERAC)

   OR

   Show filmstrip: "Beer Can on the Highway" or "Solid Wastes" (Centron - 1972)

   Discuss:

   1. Difficulty of waste disposal (amount, biodegradable items mixed with non-space available)
   2. Determine information available in any of these to validate students prediction on charts.

2. Things of Science (Kits)

   Write to: Membership Department
   231 W. Center St.
   Marion, Ohio 43302
   Cost: $9.50 per year (12 kits)

   1. Have students divide into small groups.
   2. Distribute Kits:
      Life Cycle of a Can
      Jars and Bottles
      Recycling
      Fossils
   3. Have students follow procedure in Kit.
   4. Students should share information at conclusion.
   5. Students should check hypotheses on charts.

LESSON 3

CONCEPT: Man is interdependent with his environment.

MATERIALS:
Page 3 of handout "Archaeology"
Teacher transparency of page 3
Overhead projector
Books: Gulbok, Shirley
Tut-Ankh-Aman's Tomb
Shrine (outermost) - 75
Canopic Chest - 79, 127
Anubis - 79, 126
Second shrine - 87
(Innermost) shrine - 93, 95
Sarcophagus - 96, 97
3rd coffin - 98
1st coffin - 100, 111
(innermost)
2nd coffin - 105
Mummy mask - 113
Mummy - 120

Ancient Egypt (Great Ages of Man), Time-Life Books

The Pyramids and the Sphinx - Newsweek Books
Additional pictures - 118-131
Mummy mask - 128-29
Shrine - 124
2nd coffin - 125

Make slides from pictures in books mentioned above.

Film: "Egyptologists" (available ERAC) - brings out facts about excavating in Egypt (Valley of Kings, Abu Simbel, etc.)

Notes to the Teacher
"Ancient Egypt" (color transparency book) See Master Materials List
Notes included

PROCEDURE:
1. Have students read page 3 and answer questions.
2. Discuss vocabulary with students (sarcophagus, effigy, mace)
3. Use slides to illustrate page 3 and vocabulary
4. Write out King Tut's Tomb on the overhead and have students copy it. Show pictures of tomb.
5. Use pictures of Tut's Tomb (master enclosed) Class makes a list of items found in Tomb from pictures (compile list as class watches slides)

(not a complete list)

Religious Items:
- anubis
- boats

Food and plant items:

Power symbols
- mace
- guards

Jewelry and precious items
- chest of jewels

After life
- funnerary bed
- coffins
- shrines
- mummy

For teacher's benefit

Discuss the following questions with students.

1. What do these tell us about what the Egyptians valued or thought was important.

2. What kind of decay is evident in the remains found in tomb. (discuss mumification)

3. Why hasn't more decay taken place? (teacher emphasize Egyptian climate)

4. What causes decay? (If you can, tie this in with present day activity found in Lesson #2 Suggested Activities)

5. What do Tut's Tomb and our Present Day Artifact Pile have in common?

6. How are they different?

6. Show film "Egyptologists". Discuss it and compare it to "Garbage", "Trouble With Trash" or "Beer Can on the Highway" from Lesson 2.

1. What difference can you note between them?

2. What are we leaving to be found 4,000 years from now and how does this compare to what we have found from past civilizations?

3. What will future generations say about us?

(Have students check remains in artifact box and make up some hypothesis about question #3.)

EVALUATION ACTIVITY:

1. Use "Ancient Egypt" (color transparency book) and show pages.

2. Give students notes from this (see attached).

3. Have students write an essay from information on King Tut, "Ancient Egypt" and "Egyptologists". Explain how the Egyptians treated nature (their environment) and give examples of this from notes, film, etc.

SUGGESTED
EXTRA
ACTIVITIES:

1. Using "Man and His World", read pp. 312-320.
2. Answer questions, page 321, Developing Concepts, #1-5.

LESSON 4

CONCEPT: The deterioration of man-made objects is unstable. Man and his cultural things are at the mercy of time, as are all parts of the environment.

MATERIALS:
Page 4 of "Archaeology" handout
Teacher transparency of page 4
Library books (see Bibliography)
Overhead projector
Text: Man and His World (see materials)
Master: questions, pg. 4, 5, 6

PROCEDURE:

1. Students should read and answer questions on handout related to that page.

2. Obtain books from library (see Bibliography) on archaeology. Show pictures of aerial photos, underwater photos and underground photos. Discuss these with students.

3. Jessup, Ron - The Wonderful World of Archaeology
   Pictures:
   - Standard of Ur - p. 14
   - Tut's Tomb - p. 38, 79
   - Grid excavation - p. 48
   - Harp of Ur - p. 51
   - Dead See Scrolls - p. 52-53, 62
   - Aerial photos - p. 58, 59
   - Underwater photos - p. 60
   - Cunieform - p. 73
   - Hieroglyphics - p. 77
   - Mummy - p. 84
   - Pyramid - p. 89

4. Questions for discussion:

   1. Why don't things grow in a certain area? (If you can - take a walk around the school yards, note paths, playing field, etc. Correlate this to page 3)

   2. What causes things to be preserved? (Situation: If you had two live plants and you watered one and didn't water the other, what would happen?)

   3. Look at artifact box again. Any change?

EVALUATION ACTIVITY:

1. Have students read pp. 198-212 Man and His World about Jericho and Ur.

2. Answer questions page 213. All sections.

3. Discuss with students
   a. How did they treat their environment?
   b. What was most important to these people?
   c. List on the board
      The Gods
      The Forces of Nature
      Priest (who understand the Gods)
      Men (servants of the Gods)

   These words, and the order they are in, represent the idea of life in Ur.
      1. What was the general philosophy of life?
      2. How did these people feel about Nature?
      3. Why are the Forces of Nature above the priests and men?

   Compare these views of nature (Jericho and Ur) to the Egyptians view. (Note similarities and differences)

SUGGESTED EXTRA ACTIVITIES:

1. Read an excerpt about Ur to the class from Lissner, Ivar, The Living Past, Capricorn Books, New York, 1961, Price $1.95.

2. Show movie "Ancient Mesopotamia" (See Instructional Material Guide)

LESSON 5

CONCEPT: One can analyze an object by determining what age it is. Over a period of time places change.

MATERIALS:
Handout page 5 and 6, "Archaeology" (class set)
Teacher transparencies of pages 5 and 6
Overhead projector
Pictures of one place at school
Tree ring sample
Old and new things (see Procedure)
Notes on dating methods

PROCEDURE:

1. Students should read and answer questions from pg. 4, 5 and 6 about page 5 and 6.

2. Vocabulary words to emphasize

Dendrochronology	Varves	Flourine
Stone Age	Bronze Age	Iron Age
Carbon 14 - (Radioactive Dating)		Thermoluminescence

3. Obtain sources on dating methods from library. Give notes for more detail for students on each method. (See notes included)

   1. obtain log sample and have them count rings of tree

   2. obtain old and new items and have them estimate age

4. Using your photographs of one place in school (see Pre-Unit Activity) arrange in the order they were taken. Ask questions:

   1. What has change in picture?

   2. Why has it changed? Have them list:
      a. man-made reasons
      b. non-man-made reasons

EVALUATIVE ACTIVITY:

1. Have students determine the youngest and oldest thing (not people) in or at the school.

   a. Rank the things in order of age. How do we determine age?

   b. Discuss - How do you feel about old things? new things?

   c. Ask each student to bring in one old thing and one new thing (they will not be returned, so make them unvaluable). Preferably something of personal significance.

   d. Class should make a collage of these things. Arrange and glue items on large piece of tag board.

e. Class should write one paragraph describing oldness or youngness without using those words and tell what do we do with old or used things? Why?

LESSON 6

CONCEPT: One's culture determines one's view of nature.

MATERIALS:
Films: "Rice" - available ERAC
"The Hunters" - available ERAC
Student notebooks
Chart of views of nature
(completed for teacher; have students make one of their own)
Man and His World:
American Indian Attitudes Toward the Land (an excerpt from Man and His World, pp. 131-133)

PROCEDURE:

1. Discuss with students the various views of nature they have already been exposed to. List these headings on the board and write students' resp onses under each. Have students copy this in their notebooks.

Egyptian View	Ur View	Jericho View

2. Have students read handout on the American Indians' Attitude or pp. 131-133, Man and His World.

Discuss:
1. Why did the Indian love the land?
2. What was his philosophy of how land should be treated?

3. Include another heading to the chart about American Indian and include points under it.

4. Show film "The Hunters". This film shows life among the Kalahari Bushmen of Africa, a primitive nomadic group. Emphasize the close relationship of religious economic and social customs surrounding the Bushmen's treatment of his environment. Include points under another heading - Kalahari Bushmen's View also Man and His World, pp. 516-17, 102-03.

EVALUATION ACTIVITY:

1. Have students write one paragraph discribing the American View of Nature.

2. Have students then write their own view of nature. Discuss how their own view of nature compares to one on the chart (Egypt., Ur, etc.) Why is it different?

SUGGESTED EXTRA ACTIVITIES:

1. Show film "Rice" (McGraw-1965) on comparable film.
The movie "Rice" discusses the importance of the food to over 2/3's of the world population. It is a good film to show students at this point. The film brings out the close tie between man and nature in the Asian culture.

2. Following film, hold a class discussion; bring out main points, emphasize man's relation to nature in this or similar film.

LESSON 7

CONCEPT: Deterioration of man-made things is unstable.

MATERIALS:
Present Day Artifact Pile
Student's original chart from Lesson 2
Chart of Decomposition (See master enclosed - class set)

PROCEDURE:

1. Have students view the artifact pile and note decomposition of each item.
2. Discuss and speculate as to the accuracy of original chart from Lesson 2.
3. Have students write a brief paragraph pretending they uncovered this pile 1,000 years from now and tell them to list everything they could tell about the people from the contents of this pile.
4. Have students read their paragraphs. Make a list of items that would appear most like their original appearance.
5. Turn discussion from this point to the problems of solid waste disposal. Discuss recycling.

EVALUATION:

1. Have students make a bulletin board display about recyclable items vs. non-recyclable ones.
2. Have students display on bulletin board archaeological dig of future - (using written and visual items) with analysis of our civilization from future view.

FINAL EVALUATION:

1. Review sheet of unit included.
2. Final test
3. Small quiz

MASTERS

MAKES CHARTS

STUDENT HANDOUTS

REVIEW SHEET

TESTS

TEACHER INFORMATION

The Study of Archaeology —

THE SCIENCE OF DIGGING UP THE PAST

ARCHAEOLOGY: Digging up the past is the task of archaeology. The word comes from two Greek terms meaning study of (logos) on ancient (archaios) things. Archaeologists study the material remains of human life. Pottery, tools, baskets, tombs, sculpture, the foundations of buildings -- all tell a great deal about how ancient peoples lived. They tell how civilizations began, developed, declined, and disappeared. By broadening the knowledge of mankind's past, this science gives a better understanding of man today.

Archaeology combines the excitement of a treasure hunt with the labor of a detective. Only rarely is a princely fortune in jewels and works of art discovered. More often the dig, or excavation, reveals bits of pottery. Sometimes clay or stone tablets covered with the hieroglyphics of a dead language are found. These require the most painstaking toil to decipher, date and assign to their places in history.

THE TECHNIQUE OF FIELD WORK

It has been said that all archaeological excavation is destruction. The evidence concerning an ancient site is contained in the layers, or strata, of soil, one above the other. Once these layers are disturbed, the evidence may be destroyed unless the most careful records are made at every step.

Archaeologists use the term stratification in referring to the strata which have accumulated during man's occupation of a site. How were these layers deposited? In the Near East, for example, houses are built of sun-baked bricks. Walls of such bricks are weakened by rains and often fall. When an ancient house fell, the owner leveled off the ruins and built his new shelter on top of them. The floor of the new house then rested directly on the leveled ruins of the old one. As this practice was repeated all over the town for many centuries, the community as a whole slowly rose until it stood on a mound, sometimes of considerable height. Eventually the latest town might be abandoned because of famine or war. It then fell into ruins and was covered over with windblown sand, humus, and vegetation.

Such a mound is today a great stratified treasury of ancient life. An archaeologist may cut down through it as he would through a layer cake. The lowermost stratum may be thousands of years old. The archaeologist numbers each level and measures it exactly. He is thus able to record the level at which every object is found.

Archaeologists sometimes dig trial trenches preliminary to excavating. They may divide a large area into grids like a giant waffle iron. Everything removed from the site is identified with the grid in which it was found. Each particle of earth is sifted in order not to overlook the smallest object. Photographs are made of every phase of the work. Thus the archaeologist's records give him a picture of the successive stages of life in the city.

THE IMPORTANCE OF POTTERY

Early in his history man discovered that clay could be molded into pottery. Later, he learned that if clay bowls were fired (baked) they hardened, lasted longer, and held water better. Still later he made pottery that was beautiful as well as useful. Pottery broke easily. Because it was cheap and simple to make, the pieces were thrown out and new articles were made. Broken pottery is almost indestructible. Countless pieces accumulated in and around a site that was occupied for any length of time. Such pieces are called potsherds.

An archaeologist can learn a great deal from a study of potsherds -- whether the pottery was shaped by hand or on a wheel, how it was fired, and how it was decorated. From the earthenware found in the various levels of a site he sets up a sequence, showing how the pottery of that site developed. By comparing the sequence of one site with that of another, he arrives at comparative ages of settlements.

All sorts of everyday objects, known as artifacts, are gathered by archaeologists and arranged to show how one developed out of another. Such a method of study is called typology, which means the "science of types."

EXPLORING KING TUT'S TOMB

One of the most spectacular of all discoveries was the bomb of the Egyptian King Tutankhamen. Its story shows the fascination that ancient things hold for modern man.

After eight years of searching, Howard Carter, a British explorer, found the tomb in 1922 in Upper Egypt. Before opening it he sent for Lord Carnarvon, his financial backer who had worked with him on the earlier researches and was away in England.

At the base of a descending entrance gallery was a sealed door. Within was an antechamber filled with the most wonderful things -- golden couches buried under the personal possessions of the king; four gold chariots covered with elaborate decoration; a golden throne; and alabaster vases.

Against one end of the chamber stood two life-size statues made of dark wood adorned with gold. Each held a gilded mace in one hand and a long guilded staff in the other. Traces of a doorway could be seen on the wall between the statues. It had been plastered shut and them stamped with royal seals.

It took two months to clear out the antechamber and open this door. Inside they found a splendid shrine 17 x 11 x 9 feet high. It was covered with gold and inlaid with panels of brilliant blue faience showing magic symbols to protect the dead. There were three more shrines inside the greater outer one. Finally, inside the fourth golden shrine, they found the sarcophagus of the king. It was of yellow quartzite with a sculptured goddess spreading protecting arms and wings over its foot. Inside the sarcophagus was a coffin with a golden effigy of the boy king in low relief on the lid. Most touching of all, in that overwhelming splendor, was a wreath of withered flowers on the brow of the effigy. It had been placed there 3,250 years before, perhaps by the hand of the king's young widow.

FINDING NEW DIGS BY AERIAL SURVEY

Aerial photographic surveys locate sites in country that is inaccessible from the ground. Charles Lindbergh in 1929 made the first aerial survey of the Mayan ruins of Yucatan for the National Geographic Society. In England, southern Europe, and Egypt air surveys have revealed many hitherto unknown ruins.

Some plants prefer silted-up ditches. One pre-historic settlement was revealed by the ring of poppies growing in the old rampart ditch. A food-storage pit may be discovered by the fact that young wheat grows more luxuriantly over it. The soil, that fills the pit is looser than the surrounding soil, holds moisture better, and furthers a finer growth of wheat. From the air the greener wheat tells the archaeologist that something interesting may lie under it. Roads and walls, on the other hand, are outlined by lines and streaks of stunted growth caused by the shallower soil. Photographs must be made before the harvest, in spring and early summer.

PHOTOGRAPHS BELOW THE GROUND

In recent years an Italian archaeologist, Carlo Lerici, took photographs below the surface of the ground before he began digging. Aerial maps had located Etruscan tombs scattered over the Roman countryside. To find out whether the tombs were worth the cost of excavating, he drilled holes above them. Then he drove in an aluminum tube equipped with a special camera and flashlight. The time camera photographed the entire tomb.

PRESERVING AND RESTORING FRAGILE OBJECTS

Objects of great antiquity may crumble to dust when they are exposed to the air and moved. Sometimes they have already rotted away leaving only an impression in the earth. Delicate objects are now coated with a preservative before they are moved.

Leonard Woolley, the English archaeologist who excavated the Sumerian city of Ur in the 1920's and 30's, saved hundreds of fragile objects with ingenious "firstaid" measures on the spot. One of the precious finds in the cemetery was the royal standard of Ur. This was a panel covered with a mosaic of figures in mother-of-pearl and mussel shell on a background of lapis lzauli.

The panel was broken into innumerable pieces. Wooley covered the fragments with hot wax. After the wax hardened, he cut the pieces free and bound and reinforced them with muslin. Photographs and detailed notes recorded the position of every piece. It was possible to recement the entire panel. Thus restored, it shows what life was like in Ur nearly 5,000 years ago. A banquet scene gives information on dress and household implements. The bringing up of sacrificial animals tells what animals were domesticated at the time. There were warriors with their weapons and armor, chained slaves, and wheeled chariots -- the oldest picture of wheeled vehicles known on earth.

In another instance at Ur, Woolley observed two curiously placed holes in the ground. He poured liquid plaster into the holes. When the plaster had set, the earth was removed. The archaeologist now had a plaster cast of a harp. Its wooden frame work had rotted away, leaving the openings which the plaster had filled. The ornamental metal parts, including a ram's head of gold, were still in place.

HOW OLD IS IT?

The first question asked by visitors to a museum is "How old are these objects?" Curiosity about the age of things made by man in the past is shared by archaeologists, for it is impossible to reconstruct the history of ancient civilizations without dates.

In the early days of archaeology it was assumed that without written records it was impossible to date the sites and objects associated with prehistoric man. Ancient written records go back no further than about 4000 B.C. Coins bearing dates were invented less than a thousand years before Christ.

The first scholar to introduce the idea of time into prehistory was a Dane, Christian Jurgensen Thomsen. He suggested that the many artifacts dug up all over northern Europe could be grouped into three stages marked by three great steps up the ladder of civilization. In his 'Guide to Scandinavian Antiques' (1836) he proposed that these steps be called the Stone Age, Bronze Age, and Iron Age.

A Swedish archaeologist, Oskar Montelius, worked out the first detailed system of classification of prehistoric tools, weapons, and ornaments in these three ages. Although scientists did argue about the actual dates of given periods, there was a general agreement on the relative order of the periods. One scientist, in fact, was 8,000 years astray in his estimate of the beginning of the Old Stone Age in Denmark. No one, however, disputed the fact that the Old Stone Age preceded the New Stone Age. Archaeology was now an established science, where before it had been little more than a matter of digging up "antiquities" and stowing them away in dark corners of a museum.

RADIOCARBON DATING

The dating of objects made of charcoal, wood, shell, grain, and bone has been revolutionized by a technique developed by Prof. Willard F. Libby at the Institute for Nuclear Studies of the University of Chicago. It is based on the fact that all living matter contains a uniform proportion of carbon-14. Carbon-14 is an unstable (radioactive) heavy form of carbon with an atomic weight of 14. When an organism dies, the radioactive carbon in the dead matter immediately begins to decay at a steady rate. Its half-life is about 5,700 years. During the next 5,700 years it is reduced again by one half, leaving one fourth of an ounce, and so on. The amount of radioactive carbon remaining, therefore, is the measure of its age.

The laboratory procedure consists of burning a sample to be dated. It may be a bit of wood from the roof beam of a Mayan temple or from the plank of an Egyptian ship. Cotton cloth and other fabrics from graves, the charcoal from an ancient ship, or pieces of bone also are objects that can be examined. The sample is reduced to pure carbon and measured in a special kind of Geiger counter. Very old samples contain so little carbon-14 that the method becomes ineffective beyond 50,000 years.

DATING POTTERY

A new technique has been developed for arriving at the age of a piece of pottery. It is called thermoluminescence. George C. Kennedy and Leon Knopoff, professors at the University of California Institute of Geophysics, discovered

that when pottery is heated to about 800° F. trapped electrons are released. They create a glow which can be measured by a photomultiplier tube. The more light emitted the greated the length of time since the material was first baked or last used in a hot fire. Objects as old as 100,000 years can be dated in this way. It is especially valuable in determining the ages of prehistoric societies that left no materials containing carbon which can be dated by the carbon-14 method.

BOTANICAL EVIDENCE IN DATING

Professor Andrew E. Douglass of the University of Arizona devised a method of counting and measuring the annual growth rings in timber. Starting from a known reference date, he worked out a series dating back 3,000. In the American Southwest it has been possible to match wooden beams from early Indian settlements with the series and arrive at the exact year in which the roofs and doorposts were cut. The method is known as dendrochronology, meaning "tree dating". It can be used only where regular annual changes of climate are sufficient to show up in the growth rings of trees. It has not been possible to build up a similar series in Europe.

From botany archaeology uses another dating tool. Plant pollen is practically indestructable. It may be found in utensils where graves or village sites are uncovered. Pollen is easily identified under a microscope. Botanists know when certain plants grew in certain parts of the world. Thus analysis of the pollen can date the materials with which it is associated for any period back to the Ice Age.

GEOLOGISTS HELP DATE MATERIAL

Geologists know that each layer of the earth's crust has a certain time span. They therefore can determine the ages of archaeological finds according to the material in which they are embedded. The remains found in the gravel beds left by retreating glaciers of the Ice Age can be accurately dated.

Another geological technique is based on counting the annual layers of silt, called varves, deposited in glacial lakes. Baron Gerard de Geer, a Swedish geologist, worked out a series that goes back 17,000 years, starting with a point at Regunda, Sweden which could be exactly dated as A.D. 1796. The series is applied to remains from Southwestern United States.

The archaeologist can determine which bones at a site are the oldest by making a fluorine test. Fluorine from ground water forms fluorapatite in the bones. The oldest bones at any one site would contain the largest amount of fluorapatite.

DECIPHERING ANCIENT WRITING

Deciphering early forms of writing is one of the most fascinating and difficult problems in the field of archaeology. The languages of ancient lands around the eastern end of the Mediterranean have ceased to be spoken - Hittite in Asia Minor, Babylonian and Assyrian, and the early tongues of Egypt, Greece, and Crete. Moreover, the writings of these dead languages is in a form that is no longer used. When rolls of papyrus, clay tablets, and stones with carvings were first discovered, no one could read them.

WHY ARE SO MANY ON AN ARCHAEOLOGICAL "DIG"?

We have learned much of what we know about early man and ancient settlements by the remains that were left behind. A person who digs for these remains and interprets what he finds is called an *archaeologist.* An excavation project is known as a "dig."

• CLASSIFICATION

An archaeologist must have a definite plan of how he is going to work. This is part of the archaeological method. There are many steps in the plan, but we will use only six for this exercise. They are listed below. See if you can number them in the correct order. (Use *1* for the first step; *6* for the last.)

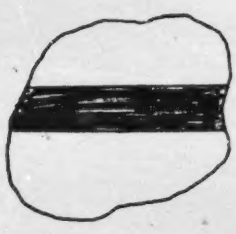
____ a. Dating and laboratory work
____ b. Interpreting what is found
____ c. Locating the site, or place
____ d. Publishing the results in books
____ e. Digging the site
____ f. Laying out the site for digging

ANALYSIS

When a site has been located and selected for excavation, the archaeologist must plan how he will dig for artifacts, such as tools and weapons. The purpose may be to excavate all of a site or to excavate it partially for sample artifacts.

Below are sketch maps of four methods of excavation. Read the following descriptions of these methods. Then write the letter of each description under the map to which it applies.

A. This method is the most complete way of digging a site. The site is divided into smaller, numbered areas. Each area is excavated.
B. In this method, only a quadrant, or one fourth, of the site is excavated.
C. This method consists of digging a long trench across the site. This is good for showing the layers of deposits.
D. In this method, the site is laid out in five- or ten-foot squares and every other square is excavated.



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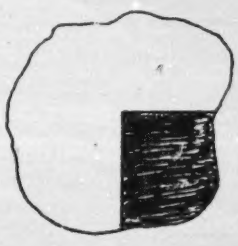

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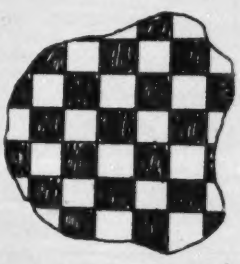

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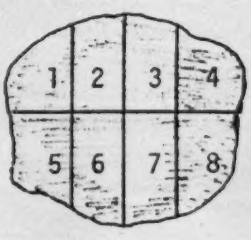

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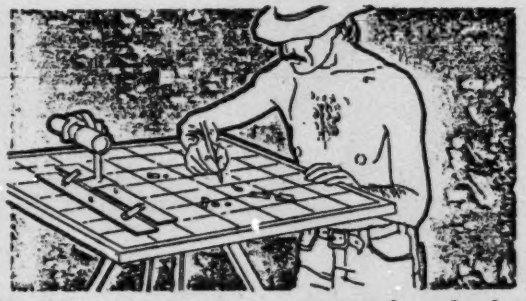
OBSERVATION/ANALYSIS

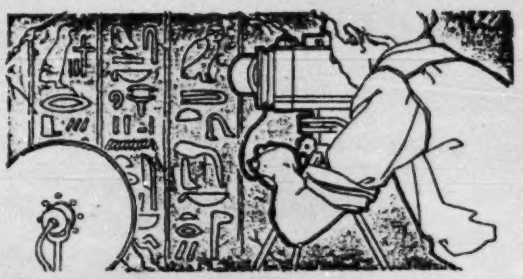
The digging of a site involves many different people who are experts in various sciences. Pictured below and at the right are some specialists who work *in the field* with the archaeologist. Read about each of them. Then look at the following list of tasks they perform. In front of each one, write the number of the specialist who performs that task.

____ a. He makes coverings for fragile bones.
____ b. He marks the position of each bone that has been found.
____ c. He takes pictures of the artifacts that have been found.
____ d. He draws a map of the site.
____ e. He cleans and restores artifacts and fossils.
____ f. He determines what natural processes took place in the region.
____ g. He observes the surface features at the site.
____ h. He makes a photographic record of the excavation work.
____ i. He helps with the dating of the site.
____ j. He provides the data for cross-section drawings of the site.

SPECIALISTS IN THE FIELD



2. *The draftsman draws maps and marks the position of each object found.*



3. *The photographer records artifacts and buildings as they are excavated.*

4. *The preparator protects fragile bones and artifacts, and later mends them.*

1. *The surveyor obtains information for maps and cross sections of the site.*

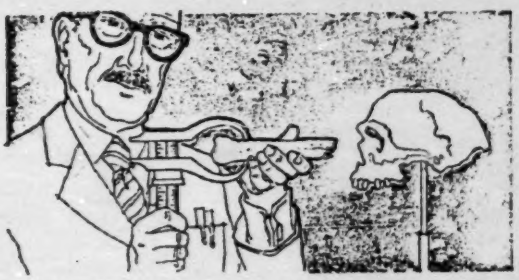
5. *The geologist studies the earth history of the region to help in dating.*

SPECIALISTS IN THE LABORATORY

OBSERVATION/ANALYSIS

1. *The geochemist analyzes the composition of finds and makes dating tests.*

2. *The paleontologist studies fossilized animal bones.*



3. *The physical anthropologist studies human bones to determine bodily features.*

4. *The petrologist identifies the stones and minerals in the area of the site.*

5. *The palynologist identifies plant life of the area from fossilized pollen.*

When work at the site has been completed, the artifacts are brought into the laboratory. Here many other people are involved in the process of *interpretation.*

At the left and below are pictures of some of the people who work *in the laboratory.* Read about them. Then look at the following list of tasks they perform. In front of each one, write the number of the specialist who performs that task.

____ a. He classifies the stones and minerals that were used for tools.
____ b. He examines human bones.
____ c. He specializes in fossilized plant pollen.
____ d. He tells us what animals were used as food.
____ e. He determines the age of the materials found.
____ f. He studies fossilized animal bones.
____ g. He can tell that ornaments made of certain stones were traded from other places.
____ h. He can tell what plants were available for food.
____ i. He makes chemical tests on artifacts.
____ j. He can tell whether the people were tall or short.

SOURCE: Problem-Solving Booklet, Man and His World, Teacher's Edition, Contemporary Social Science Curriculum, Silver Burdett, General Learning Corporation, 1972, pages 62-64.

WHY ARE SO MANY ON AN ARCHAEOLOGICAL "DIG"?

KEY

Classification

a. 4
b. 5
c. 1
d. 6
e. 3
f. 2

Analysis

c, b, d, a

Observation/Analysis - Specialists in the field

a. 4
b. 2
c. 3
d. 2
e. 4
f. 5
g. 1
h. 3
i. 5
j. 1

Observation/Analysis - Specialists in the laboratory

a. 4
b. 3
c. 5
d. 2
e. 1
f. 2
g. 4
h. 5
i. 1
j. 3

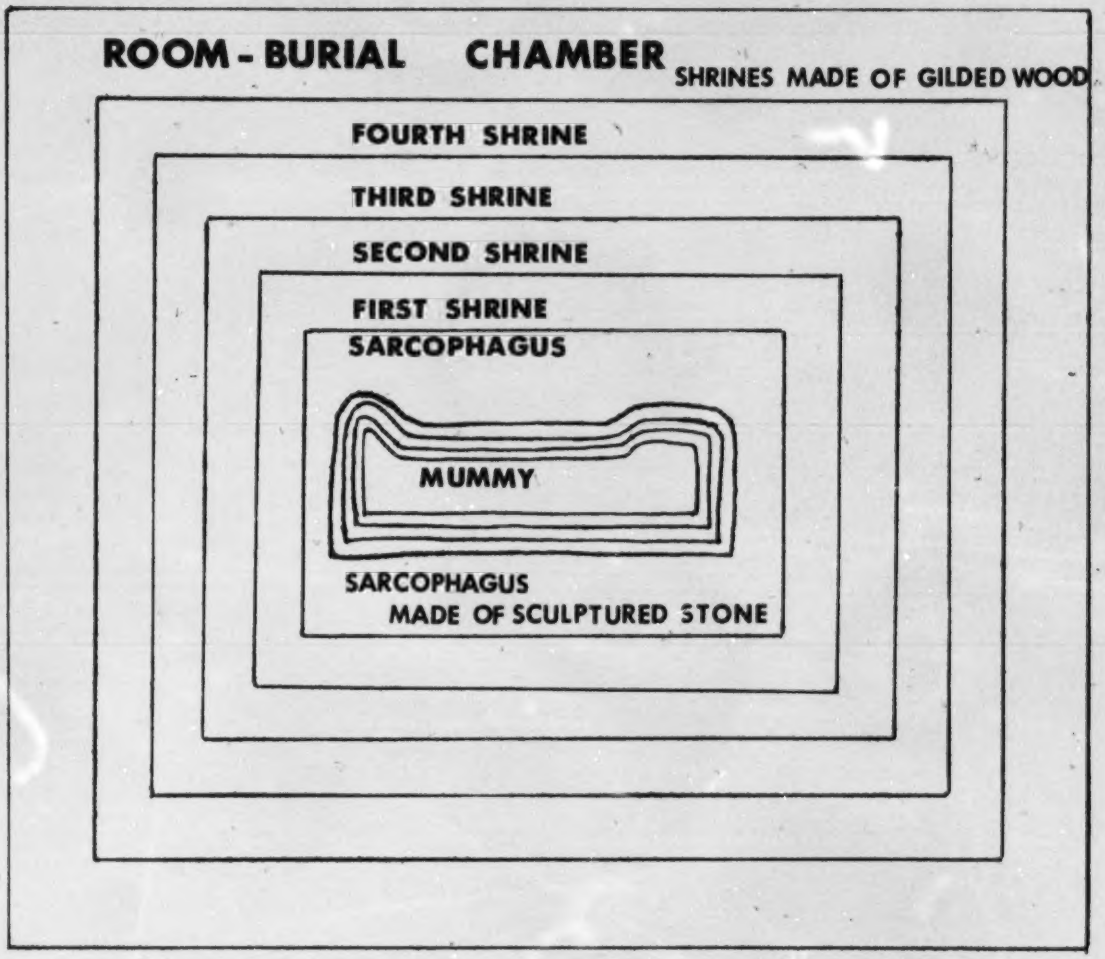
PRESENT DAY ARTIFACT CHART

LESSON 2

NAME OF ITEM	INGREDIENTS	LASTS 100 YEARS OR MORE	LASTS FROM 50 - 100 YEARS	LASTS FROM 1 - 50 YEARS	LESS THAN ONE YEAR	BEST WAY TO DISPOSE OF ITEM

Tutankhamen's Tomb (copy of this in Book Secret's, p. 69)

Took over 70 days to prepare a body for mummification. Prayers and rituals must be followed to insure Ka's afterlife. Internal organs were removed and interred separately. (Canopic jars)



Body of mummy was 6 feet, one in. tall.
First coffin made of gold, was 6 feet, 1 3/4 inches long - called an Anthropoid coffin
(Took 8 men to lift 1st coffin containing mummy. weighed 3 tons)

135 sacred objects wrapped in linen around mummy's body - plus many jewels.

Fingers and toes individually wrapped in linen, then covered with gold guard. Solid gold mask placed over mummy's head - then mummy placed in first coffin.

INFORMATION TO TEACHERS:

Mummification is the process of removing the organs and preserving the body for the after life. The process took about 70 days to complete. The brain, heart, viscera were removed. The heart which the Egyptians believed to be the seat of the intellect, was put back in the body to provide it with the know-how to reassemble itself in the after life. The remaining viscera were placed in canopic jars (see pictures in King Tut references) to be ready at hand when needed for the reassembling process. The body, minus the viscera, was soaked in Natrop, a drying agent for 70 days. Then the body was wrapped in muslin with ornaments to hold it in place. Depending on the wealth of the individual, various gems and valuables were wrapped within the muslin. The Egyptians believed that the body must regain as closely as possible its original appearance in order to proceed to a life after death, hence the mummification process. The Ba (body) and the Ka (spirit) were two important elements to them. The Ka reentered the mummified body for its after life. The Egyptians so loved their lives that they wanted to continue it in the hereafter. If the body was not preserved, a second and final death would occur for which there was no resurrection.

Use "Ancient Egypt" (transparency book) to illustrate points to class. Outline sections of transparency book for class (i.e. afterlife, gods and goddesses, etc.)

King Tut (p. 3)

1. Who discovered Tut's grave? _____

2. What is Tut's full name? _____

3. When was the tomb found? _____

4. Name several items found in the grave. _____

_____

_____

5. What stood at the entrance to the grave? _____

How many? _____

What were they holding? _____

6. What was stamped on the door of the grave? _____

7. How many shrines were there? _____

8. In which was the sarcophagus found? _____

9. What is an effigy? _____

10. How long ago was he buried? _____

NOTES: ANCIENT EGYPT

Taken from transparency book "Ancient Egypt"

A. Background Information
   1. 5,000 years ago was composed of neolithic farming communities
   2. Two kingdoms formed
      a. Upper Egypt
      b. Lower Egypt
   3. United under Dynasties and ruled that way for 2,000 years
   4. 30 Dynasties during period of 2,000 years
   5. Egyptian Empire conquered
      a. Lybia
      b. Syria
      c. Phoenicia
      d. Palestine
      e. Nubia

B. Historic Periods
   1. Old Kingdon
      a. time of pyramids
      b. 1st-6th dynasty
      c. 3,000-2260 B.C.
   2. Middle Kingdom
      a. 7-17th dynasty
      b. 2260-1580 B.C.
   3. The New Kingdom
      a. 18-20th dynasty
      b. 1580-1080 B.C.
   4. Kings of 21st-30th tried to rule through turmoil
      a. 341 B.C.
   5. Egypt then was conquered by:
      a. 1st - Greeks
      b. 2nd - Rome
      c. 3rd - Byzantium
      d. 4th - Turkey
      e. 5th - English
      f. present is an independent country - strong factor and decision maker for countried in present "Middle East"

C. The Great Pyramids
   1. Belonged to Old Kingdom
   2. Were only meant for pharoahs
   3. Contained secret chambers
      a. for mummy
      b. for treasures
      c. what pharoahs would need in after life
         1) food
         2) treasures
         3) power symbols
         4) servants
   4. Greatest pyramids took slaves 20 years to build
      a. made of limestone blocks
      b. weighed 15-20 tons, each block
      c. highest 481 feet high
      d. covered 13 acres

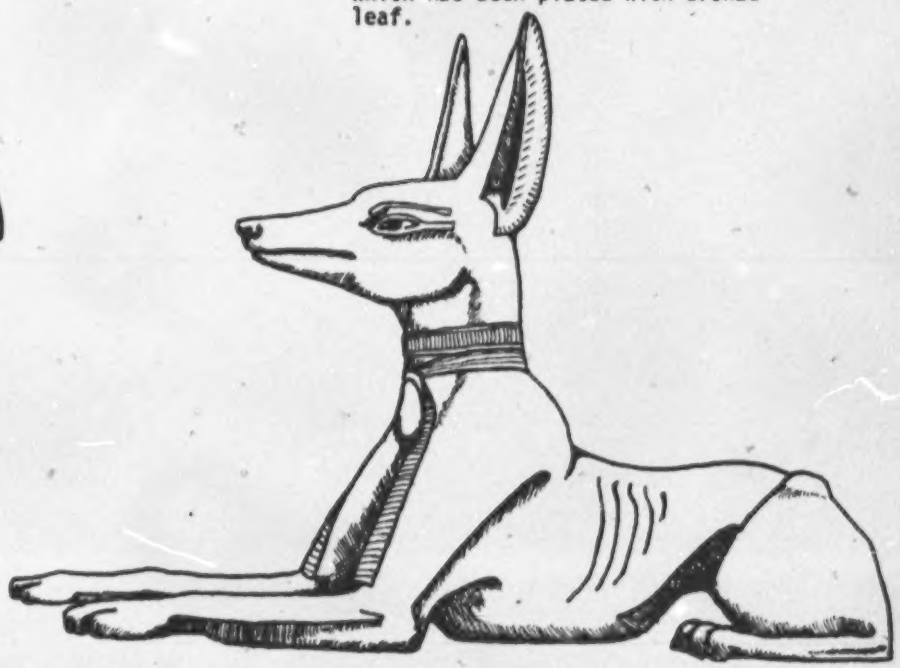
D. Gods and Goddesses
   1. Many
      a. Over 80 counted
      b. Each local area had special sets
      c. Some worshipped throughout whole kingdom
   2. Served many purposes
      a. Patrons of specific arts and professions
         1. Pteh, patron of arts
         2. Hathor, goddess of love, joy and beauty
      b. Had duties toward mankind
   3. Took different forms
      a. As animals or birds
         1. Troth, god of learning - an Ibis
         2. Sobek, water god - a crocodile
         3. Nut (Noot), sky goddess - a great cow
         4. Nekbit, special protectress of king - a vulture
      b. As humans
         1. Asiris - god of dead (the judge) mummifiform human shape
      c. As mixture of above
         1. Anubis (helper to Asiris) god of cemeteries and embalming, as a jackal headed human
         2. Hathor - human form with cow's head
   4. In time identities of gods merged and took on multiple roles
   5. One attempt to change relition
      a. Akhenaten (18th dynasty) tried to throw out all and institute supreme god - Aten - he was killed.
   6. Believed in demons too
      a. vexed soul in journey to after life
      b. souls destroyed by Devourer of Shades - half crocodile/half hippopotamus

E. Life After Death
   1. Believed that Ka (spirit) lived on after Ba (the body) first died.
   2. After life very pleasant - same aslife on earth - same duties and joys
   3. Asiris judged those worthy to live in afterlife
   4. Magic played important role in afterlife
   5. Special ritual and procedure followed in insure afterlife for Ka. If not followed, or Ba destroyed, there was a second death from which there was no return.
      a. that's why mummification
      b. that's why treasures, food figures in tombs
      c. that's why elaborate tombs and mortuaries

This funerary bedhead is made of gilded and stuccoed wood. It is thought to be a lioness because even in Ancient Egypt the royal throne was sometimes shown carried by lions. The animal's eyes are of crystal outlined with blue glass-paste, also used for the nose.

A sacred cow, one of the forms of the goddess Hathor. The head is of gilded and stuccoed wood; the eyes are of crystalline limestone and obsidian, outlined with black glass, which also forms the eyebrows. The horns are wood which has been plated with bronze leaf.

Another of the funerary bedheads shows the goddess Tueris in the form of a hippopotamus. The teeth and tongue are of ivory, with the tongue stained red.



The god Anubis, of wood varnished black with silver claws, eyes of alabaster and obsidian, other details gilded.

ITEMS RELATED TO BURIAL CHAMBER

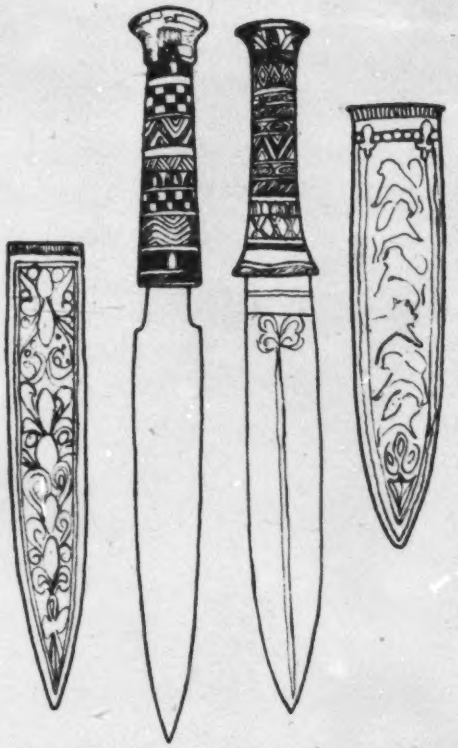
The finest gold funerary mask ever found anywhere in the world, and probably the best portrait in gold ever made. It is doubtless an exact likeness of young Tutankhamen and is lifesize. Semi-precious stones inlay the beaten gold and lapis-lazuli makes up the eyes and eyebrows. The false beard of the gods adorns the young sovereign's chin. The height of the mask is 21 inches.

One of the two lifesize statues of Tutankhamen which faced each other on each side of the walled-up entrance to the funerary chamber. Both are made of wood covered with black resin. The eyes and eyebrows are made of gold, the uraeus (headdress) and sandals are gilded.

The second coffin, made of compact wood covered with sheets of gold inlaid with multi-colored glass paste and semi-precious stones. It shows the mummified figure of the god Osiris holding his insignia in his crossed arms and wearing the long beard of the gods. The coffin is 6 feet, 8 inches long.

ITEMS RELATED TO TUT'S LIFE AND AFTER LIFE

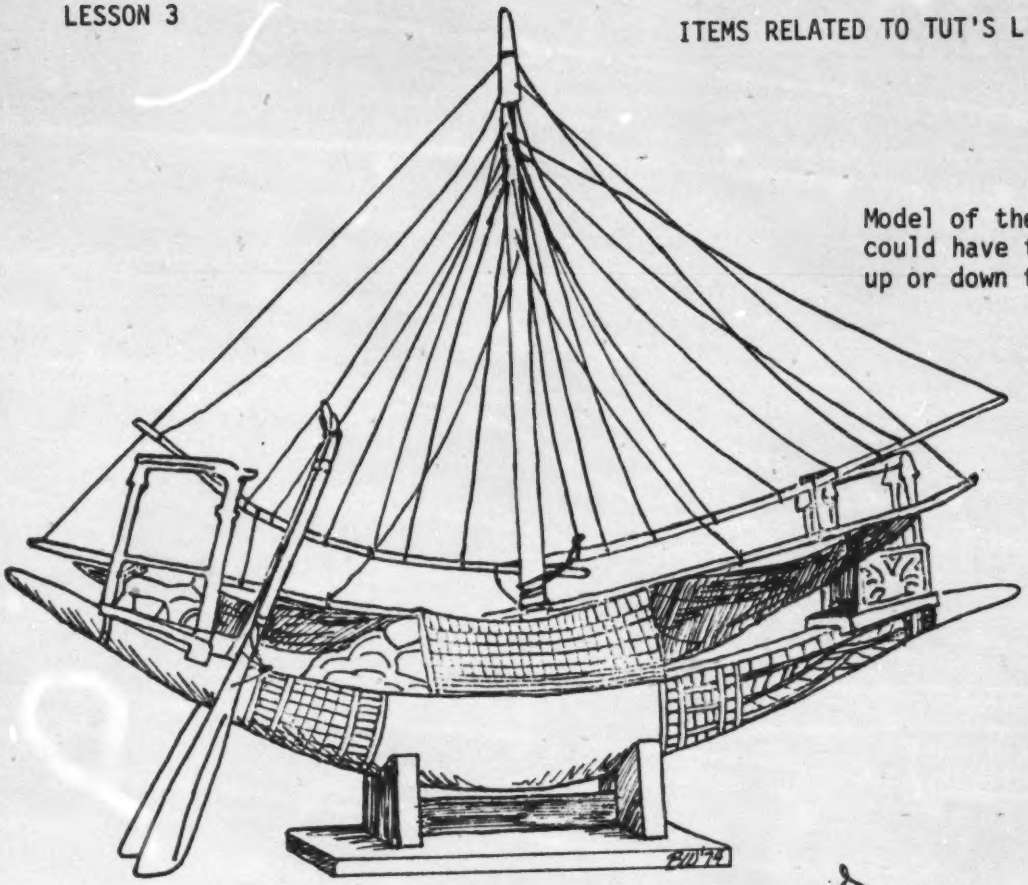
The lower end of a ceremonial cane shows the two hereditary enemies of Egypt: the Asiatic Syrian, whose face and hands are of ivory, and the African Nubian, whose arms and head are of ebony.



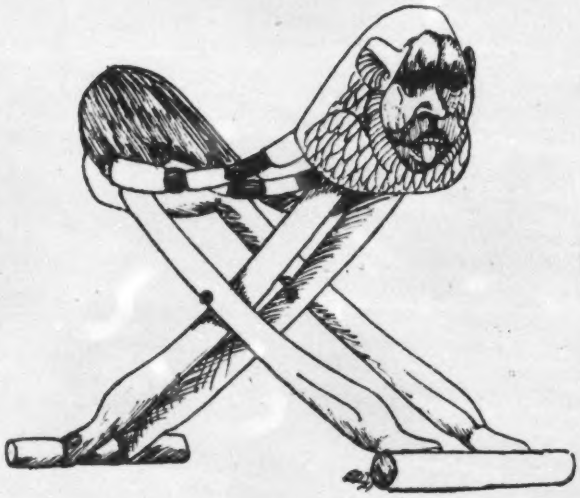
The king's two daggers. The blade of the top dagger is of gold, as is the sheath above it decorated with animals. The blade of the other dagger is of iron with a rock crystal knob on the handle; its sheath is also of gold.

This detail from a panel of one of the ceremonial chariots shows captive enemies of Egypt. The bonds ending in lily flowers show that the captive comes from the south; those ending in papyrus (center) show the captive is from the North.

ITEMS RELATED TO TUT'S LIFE AND AFTER LIFE



Model of the pharaoh's boat which could have taken him on his trips up or down the Nile.



An ivory headrest, stained dark green, red-brown and black.

A detail from the painted chest showing Tutankhamen in his chariot, doing battle with his traditional enemies, the Asiatics and Nubians.

ARCHAEOLOGY/ECOLOGY
Pages 4, 5, 6

Name
Period

1. Aerial photos help point out former locations of settlement and farming. Give examples to support this statement:

   1.

   2.

   3.

   4.

2. Old roads and walls keep crops from growing well in those areas because _____

3. _____ tombs were discovered by _____ cameras. Why did they have to investigate them in that manner? _____

4. A delicate object is called _____

5. The royal _____ of _____ was found. It is (describe it and what it tells us) _____
   _____

6. What did the two holes in the ground turn out to be? _____
   What did Prof. Wooley do to preserve this object? _____
   _____

7. The oldest form of measuring the age of something is classified by _____
   _____ and _____ ages.

8. Who discovered Carbon 14? _____ Describe the process: __
   _____
   _____

9. Describe the process of Thermoluminescence? _____
   _____

10. When can dendrochronology be used? _____

11. What other form of plant is used for dating: _____

12. Glacier dating is accomplished by counting _____, after the glaciers have retreated.

13. The amount of _____ in old bones can be used to date them.

14. Three things used by early man to write with were _____,

    _____ _____

Notes on Dating Methods

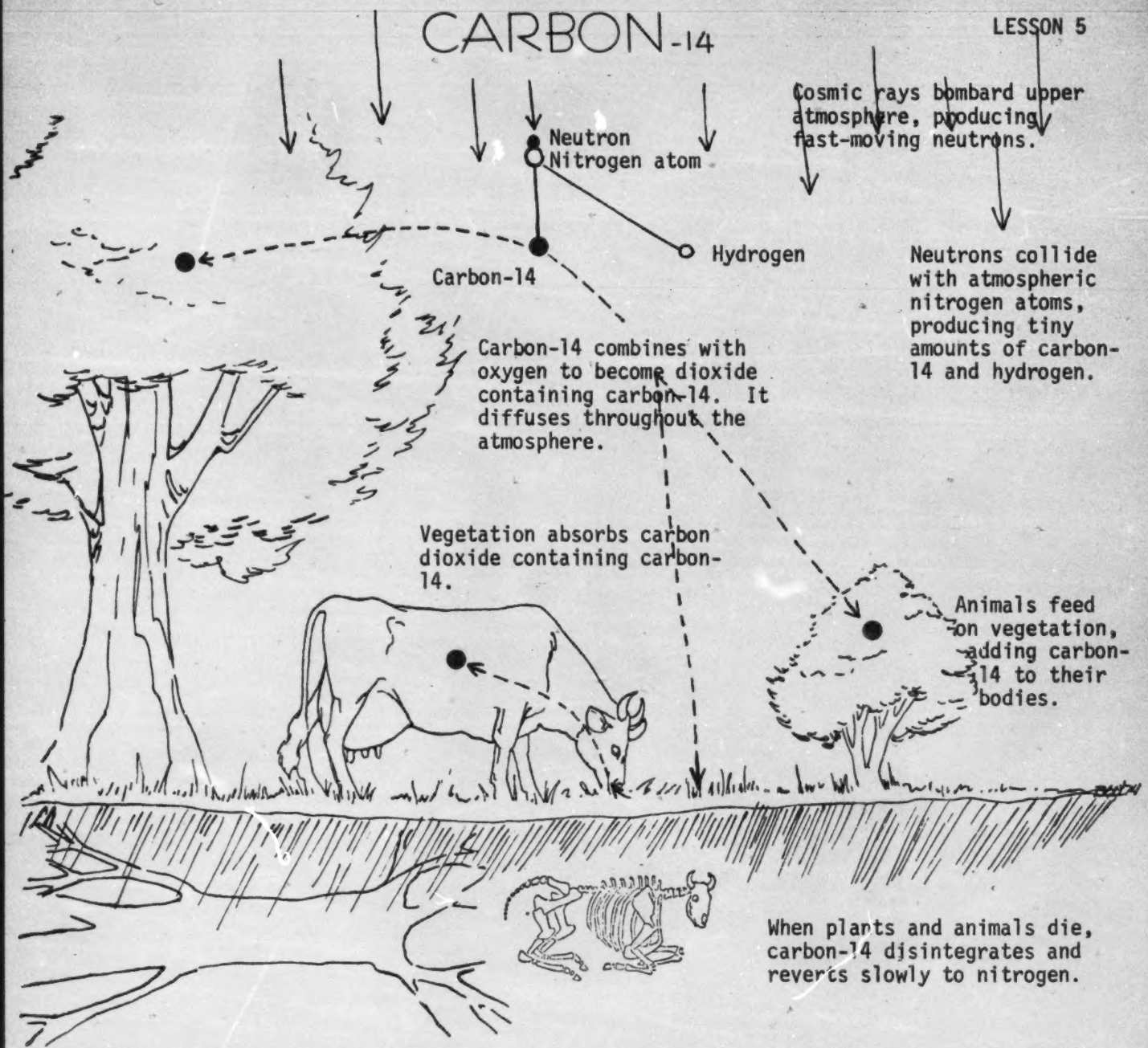
A. General Information
   1. Few methods can be used on fossils themselves because it destroys fossil
   2. New methods have greatly increased the accuracy of dating.

B. Radio-active Dating Methods
   1. Carbon-14 (see chart included)
      a. discovered by Prof. Willard F. Libby, Nobel Peace Prize for it. 1959
      b. Carbon is found in all living things. It disappears at a known rate after the plant or animal dies
      c. Procedure
         1. Sample is thoroughly cleaned
         2. Sealed in a tube and put in a furnace
         3. Burned in oxygen which turns all carbon left into carbon dioxide
         4. Carbon dioxide is purified and placed in an anti-radiation chamber
         5. Then radio active carbon is measured
      d. Charcoal is best matter. Wood and peat are good. Bone and antler are not as good (contain little carbon)
      e. This method is limited to 40,000 years because of equipment and technique
      f. There is a wide range of accuracy. i.e. 6,570 $\pm$ 340 years
   2. Potassium-Argon Dating Method
      a. Potassium 40 changes to argon 40 in volcanic material
      b. Items found in volcanic ashes can be dated this way.
      c. ½ life of Potassium is 1,300 million years. Much greater than C-14
      d. This dating method limited to deposit over 20,000 years old.
      e. Heating processes similar to C-14.

C. Other Dating Methods
   1. Varve Counting (Geochronology)
      a. devised in Scandinavia
      b. applied to melting of glaciers
      c. sediment is deposited and each one is called a varve
      d. similar to dendrochronology
   2. Dendrochronology: Tree Ring Dating
      a. trees grow by adding a growth ring each year
      b. in dry years - rings are thin
         in wet years - rings are thick
      c. Each region of country must establish its own master-pattern based on trees and climate in its area.
   3. Thermoluminescence
      a. used on pottery
      b. tells amount of radio active decay that has occured since firing
      c. when pottery is tested it is heated and light-energy is measured
   4. Flourine Testing
      a. calcium replaced by flourine when bone is burned
      b. the greater the flourine content the older the bone

Notes taken from: Bantam Science Bks., Knowledge Through Color: Prehistoric Man, 1971, $1.45
Magnusson, Magnus, Introducing Archaeology, (The Walck Archaeologies) Henry Walck, Inc., New York, 1972 $8.95

CARBON-14


Cosmic rays bombard upper atmosphere, producing fast-moving neutrons.
Neutron
Nitrogen atom
Hydrogen
Carbon-14
Neutrons collide with atmospheric nitrogen atoms, producing tiny amounts of carbon-14 and hydrogen.
Carbon-14 combines with oxygen to become dioxide containing carbon-14. It diffuses throughout the atmosphere.
Vegetation absorbs carbon dioxide containing carbon-14.
Animals feed on vegetation, adding carbon-14 to their bodies.
When plants and animals die, carbon-14 disintegrates and reverts slowly to nitrogen.

At death

5,568 years
½ of carbon-14
remains

11,136 years
¼ of carbon-14
remains

16,704 years
1/8 of carbon-14
remains

70,000 years
Virtually none
remains

VIEWS OF NATURE

American Indian
(131-133) (220)

1. Method of land utilization shows logic.
2. Unnecessary to farm - used as supplement
3. Skills passed on from father to son; skills needed to survive.
4. Would not sell the land
5. Names were taken from nature
6. Only use the plants and animals while he was here

Kalahari Bushmen
(216-17; 102-03)

1. Shared food among people.
2. Hunted with poisoned arrows carefully selected
3. Good archer
4. Matched himself to even large animals (used his sit)
5. No possessions except what they needed to survive
6. Understood location of water; where to find it in roots, etc.

Jericho
(198-204) (222-25)

1. Located on or near river
2. Heavy population density
3. Used mud - brick adobe to build houses (cool in summer and warm in winter)
4. Ample supply of spring water
5. Fertile oasis nearby
6. Building stones available
7. Easy access to routes for trade
8. Built a ditch around city for protection

Ur
(204-212) (222-25)

1. Located near rivers
2. Made bricks from river silt
3. Many marshes nearby
4. Fully completed homes with bathrooms and kitchens
5. Standard of Ur and other artifacts show strong link with nature (plants and animals depicted)
6. Mastered math and engineering
7. Sowed more grain than they needed
8. Cross breed animals
9. Irrigated and controlled flood plain

Egypt (use notes)

1. Gods and Goddesses were sometimes part animal/part human
2. Close reliance on Nile River for source of water/life
3. Preoccupation with after life - especially the pharoahs and wealthier people
4. Realized the importance of a labor force to complete elaborate building
5. Religious ceremonies performed to placate (satisfy) nature.

American Indian Attitudes Toward the Land

"The land is our mother". Perhaps *luck* is the wrong word. There was more than luck in what the ancient Egyptians made of their valley. There was more than luck in what the ancient Israelites made of Palestine. In each case, I believe, one of the chief reasons these people succeeded was their attitude toward the land. They had respect for the land. They loved it the way the North American Indians have always loved their tribal lands.

Some of those lands were blessed with abundance of game, fish, timber, grass, and water. But others were, and still are, blessed with little except sand and sunshine, cactus and sagebrush. Without exception, however, "Indian country" was greatly loved by those who lived on it. "The land is our mother" was the way the Iroquois and some other tribes put it. The Navajos were so strongly attached to their dry, rugged lands that they refused to trade them for the Oklahoma prairies offered by the United States Government.

It's a bad day for any people when they cease to be interested in the soundness or wholeness of things. If a watch ceases to be whole or sound, it ceases to go. It's the same with a piece of land. You have a sound watch only if you take proper care of it. Similarly, you have a sound earth only if you take proper care of it. And that, I believe, is better care than most of us have been in the habit of giving it. If we damage a watch beyond repair, we can buy another. But if we damage the earth, where do we go shopping for another?

"The Crow country is exactly in the right place. It has snowy mountains and sunny plains; all kinds of climates and good things for every season. When the summer heat scorches the prairies, you can draw up under the mountains, where the air is sweet and cool, the grass fresh, and bright streams come bumbling out of the snowbanks. There you can hunt the elk, the deer, and the antelope, when their skins are fit for dressing; there you will find plenty of white bears and mountain sheep".

"In the autumn, when your horses are fat and strong from the mountain pastures, you can go down into the plains and hunt the buffalo, or trap beaver in the streams. And when the winter comes on, you can take shelter in the woody bottoms along the rivers; there you will find buffalo meat for yourselves, and cottonwood bark for your horses; or you may winter in the Wind River Valley where there is salt weed in abundance."

"The Crow country is exactly in the right place. Everything good is to be found there. There is no country like the Crow country." (Crow chief, Arapooish)

"Sell the country?...Why not sell the air, the clouds, the great sea?" (Warrier chief, Tecumseh)

"The land we live on, our fathers received from God, and they transmitted it to us, for our children, and we cannot part with it...Where is the land on which our children and their children after them are to lie down?" (Cornplanter, an Iroguois, to George Washington)

"The master of Life has given us lands for the support of our men, women, and children. He has given us fish, deer, buffalo, and every kind of birds and animals for our use. ...When the Master of Life, or Great Spirit, put us on this land, it was for the purpose of enjoying the use of the animals and fishes, but certain it was never intended that we should sell it or any part thereof which gives us wood, grass and everything." (Spokesman for the Ottawa, Sioux, Iowa, Winnebago, and other tribes)

DECOMPOSITION CHART

Lesson 7

LIST ARTIFACT	MADE OUT OF	TOTALLY DECOMPOSED	PARTIALLY DECOMPOSED	SLIGHTLY DECOMPOSED	NO DECOMPOSITION

Review for Archaeology/Ecology Unit LESSON 7

MATERIALS NEEDED

Book: Man and His World
Handouts: Archaeology pages 1-6
Spiral Notebook:
Vocabulary
Notes on dating methods
Notes of Egypt
Notes on Nature
Notes on King Tut's Tomb

Questions from pages 4, 5, 6
Questions over Ur and Jericho
Chart on Philosophy of nature
Whathaveyou.....

A. King Tut's Tomb:
1. when buried
2. when discovered; by whom
financial backer
3. burial chamber
a. shrines
1. number of
2. height
3. what made out of
b. sarcophagus
c. coffins
1. number
2. made out of
d. mummy
4. other contents of Tomb
a. concerning nature
b. after life
c. show of wealth and power

B. Preservation and discovery of artifacts
1. Harp of Ur
2. Lack of air (Tut's tomb)
3. Potsherds
4. Etruscan tombs
5. Aerial Photos

C. Study your vocabulary words (use your packets as flash cards if you still don't know the words)

D. Dating methods: don't forget your notes on this

1. Professor Libby and Carbon 14

2. Thermoluminescence

3. Dendrochronology

4. Varves
Flourine too....

SUGGESTED

VOCABULARY

ACTIVITY

AND BIBLIOGRAPHY

SUGGESTED VOCABULARY ACTIVITY

MATERIALS:
colored paper
stapler
felt tip pens
vocabulary master of words and definitions (see attached)
scissors (10-15 pairs)

PROCEDURE:

1. Make copies of words and definitions for students.

2. Have students number word and correct definition (see master for example)

3. Have students cut out words and definitions along lines

4. Have students make a Vocabulary Pack:

   1. one sheet of colored paper per students
   2. Make it with two pockets on each side
   3. Staple sides
   4. Fold down flaps
   5. Label: one flap - [WORDS]

      other flap - [DEFINITIONS]

   6. Decorate and label exterior

      NAME
      CLASS PERIOD

5. Students should place words in one section; definitions in the other section.

6. Each day or every other day teacher should pick five to six numbers and write these on the board. Students should then take out words or definitions (depending on teacher instructions) and write the word or definition for those numbers.

   Students should then correct paper with opposite side of Pack.

   Students should save vocabulary tests in notebooks.

1 ANTHROPOLOGY	2 ARCHAEOLOGY	3 ARTIFACT
4 STRATIFICATION	5 HIEROGLYPHICS	6 GRID
7 POTSHERDS	8 TYPOLOGY	9 SARCOPHAGUS
10 MUMMIFICATION	11 MACE	12 AERIAL PHOTO
13 CARBON 14 DATING	14 PREHISTORIC	15 THERMOLUMINESCENCE
16 DENDROCHRONOLOGY	17 GEOCHRONOLOGY	18 DIG

9 Enclosed Tomb or enclosed series of coffins usually made of stone	10 The process of removing the organs and interior of the body, then wrapping and preserving it in death.	12 Photographs taken from an airplane for the purpose of locating isolated archaeological sites
11 A staff carried by a king or ruler - shows power or authority	13 The process of measuring radioactive carbon to determine the age of an item up to 50,000 years old. Radioactive carbon decays at a given rate	14 Period of time before written history
15 The heating process to date pottery	16 Tree Ring Dating	3 Varves (or) glacier levels that are left by receding ice. Used for dating.
1 Study of Man and his way of life	2 Study of ancient things by examining artifacts left behind.	17 An everyday object used to analyze a group of people
4 The layers that accumulate during man's occupation	5 Egyptian writing. Use of pictures and symbols to denote words.	6 The grafting of a dig so items can be labeled
8 Classification of artifacts into categories so they can be identified.	7 Pieces of pottery that are discovered in a dig. These items are practically indestructable	18 The home of an archaeological site or excavation

SUGGESTED REFERENCES: ARCHAEOLOGY

Burland, C. A., The Incas, illustrated with photographs and with drawings by Edward Shenton. Lothrop, Lee and Shepard Co., Inc., 1962.

Casson, Lionel, Great Ages of Man: Ancient Egypt, Time Incorp., New York, 1965

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Coe, Michael C., America's First Civilization, American Heritage Publishing Co., Inc., 1968, $4.95.

Daugherty, Charles Michael, The Great Archaeologist, illustrated by Leonard Everett Fisher, 1962, $3.50

Evans, Eva Knox, Archaeology, Secrets of the Past, Golden Press, 1969, $.75.

Freeman, MacBlacker, Finding Out About the Past, illustrated with photographs, Random House, 1967, $2.59.

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Heyerdahl, Thor, Aku-Aku, The Secret of Easter Island, Rand McNally and Company, 1958, $8.95

Howard, Cecil and the Horizon Magazine editors, Pizarro and the Conquests of Peru, American Heritage Publishing Company, Inc., distributed by Harper and Row, 1968 $5.49

Jessup, Ronald, The Wonderful World of Archaeology, Doubleday and Company, Inc., 1968. $3.95

Lissner, Ivar; The Living Past, Capricorn Books, 1961, $1.95

Magnusson, Magnus, The Walck Archaeology Introducing Arch The Arch of Ancient Egypt Digging up Bible Lands, Henry Walck, Inc. New York, 1972 $8.95

Samachson, Dorothy and Joseph, Good Digging, illustrated with photographs and maps. E. M. Hale and Company, 1960. $2.52

Silverberg, Robert, Lost Cities and Vanishing Civilizations, Chilton Book Company, 1962. $3.95

Stewart, Desmond, Pyramids and the Sphinx, (Wonders of Man Series, Book 4) Newsweek 1971. $10.00

Strong, Emory, Stone Age on the Columbia River, Binfords and Mort, 1960. $4.95

White, Anne Terry, All About Archaeology, with drawing by Tom O'Sullivan, Random House, 1959. $2.95

SUGGESTED MAGAZINES:

National Geographic - October 1963 - Tutankhamen's Golden Trove

Natural History

Smithsonian Magazine

For your convenience the films used in this ELE are listed on this tear out sheet. Simply add the dates required and mail to the Instructional Material Center, ERAC.

Project ECOLogy

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Detach here

INSTRUCTIONAL MATERIALS - HIGHLINE PUBLIC SCHOOLS

Please try to place orders
3 weeks in ADVANCE in DUPLICATE

Symbols for materials not booked:
NA - not available
Sub - substitution
WD - withdrawn

ORIGINAL

SCHOOL _____ TEACHER _____ GRADE _____ DATE _____

FILMSTRIP NO.	FILMSTRIPS — TITLE	DATE WANTED	NOT WANTED AFTER	DATE CONFIRMED	FILMS	DATE WANTED	NOT WANTED AFTER	DATE CONFIRMED
					Digging up the Past			
					The Silent Ones			
					Trouble With Trash			
					Garbage			
					Egyptologists			
					Ancient Mesopotamia			
					Rice			
					The Hunters, Parts I & II			

For your convenience the films used in this ELE are listed on this tear out sheet. Simply add the dates required and mail to the Instructional Material Center, ERAC.

Project ECOLogy

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ARCHAEOLOGY QUIZ NAME _____

I. MATCHING

_____ 1.	Grid	A.	helps identify isolated archaeological sites
_____ 2.	Stratification	B.	the layers of a dig
_____ 3.	Artifact	C.	pieces of pottery
_____ 4.	Potsherds	D.	a process of measuring off the dig which helps identify the artifacts
_____ 5.	Aerial Photo	E.	a tomb
_____ 6.	Sarcophagus	F.	an everyday object

II. TRUE OR FALSE

_____ 1. Several attendants were buried with King Tut.

_____ 2. Lord Carnavon and Howard Carter excavated Tut's tomb in 1922.

_____ 3. Plaster of Paris and wax can be used to help preserve artifacts.

_____ 4. Air causes the decay we see in buried items.

_____ 5. Pieces of pottery are one of the most indestructable artifacts.

_____ 6. The Carbon 14 method of dating is not accurate beyond 10,000 years.

_____ 7. Abu Simbel is a pyramid.

_____ 8. We are able to study archaeology by the fact that new houses are usually built on the leveled remains of old ones.

_____ 9. A domesticated animal is an animal which is not tamed.

_____10. Thermoluminescence is the dating process used to date human bones.

_____11. In using the method of tree ring dating, archaeologists can only tell when the tree was cut.

_____12. Pollen samples are not useful archaeological remains.

III. FILL IN THE BLANK

1. What were the three ages archaeologists used to date artifacts?

_____ _____ _____

2. Archae logy means _____.

3. Egyptian writing is called _____.

IV. ARRANGE IN ORDER: arrange the following steps that an archaeologist follows

1. sift dirt to find artifacts
2. dig trial trench
3. send artifacts to laboratory for investigation
4. label artifact
5. divide area into grids
6. dig sections of the area

(DO THIS ON THE REVERSE SIDE WRITE OUT EACH STATEMENT WITH #)

FINAL TEST
ARCHAEOLOGY

Name _____
Period _____

MATCHING: SOME MAY BE USED MORE THAN ONCE

_____ 1. live servants were buried with the kings and queens

_____ 2. judge of the dead

_____ 3. ruling families were called Dynasties

_____ 4. excavated the city of Ur

_____ 5. Mesopotamia

_____ 6. first to use the wheel

_____ 7. Egyptian god of the funeral service

_____ 8. excavated the tomb of Tutankhamen

_____ 9. the Old Kingdom

_____ 10. found guarding the entrance to the burial chamber of King Tutankhamen

_____ 11. the Ziggurat

_____ 12. valley of the Kings

_____ 13. found a harp by pouring plaster in holes in the ground

_____ 14. financed King Tut's excavation

_____ 15. Fertile Cresent

A. Osiris
B. Anubis
C. Howard Carter
D. the pyramids
E. Ur
F. Lord Carnavon
G. Leonard Woolley
H. Egypt
I. Professor Higbee
J. Statues

IDENTIFY THE USE OF THE FOLLOWING:

1. canopic jars _____
2. potsherds _____
3. aerial photos _____
4. mace _____
5. grid _____

Vocabulary -- Fill in the correct word (and spelled correctly) to complete each of the following sentences.

1. The _____ was made out of stone in Tutankhamen's burial chamber.
2. Many examples of Egyptian life, _____, have been found in tombs.
3. The _____, indestructible items found in an archaeological dig, were made out of clay.
4. Charles Lindbergh took _____ photos of Mayan ruins in Yucatan.
5. _____ is the PROCESS by which a body is preserved. This preserved body is called a _____.
6. Professor Libby invented the process of _____.
7. The time before written history is called _____.
8. Receding glaciers leave _____.
9. Using a cross section of a tree, one can use _____ to date it.
10. Putting things into categories is called _____.
11. An archaeological site is called a _____.
12. Layers of different colored dirt is called _____.

ARRANGE IN ORDER: ARRANGE THE FOLLOWING STEPS THAT AN ARCHAEOLOGIST FOLLOWS

_____ 1.
_____ 2.
_____ 3.
_____ 4.
_____ 5
_____ 6

a. sift dirt
b. dig trial trench
c. send artifacts to laboratory for investigation
d. label artifact
e. divide area into grids
f. dig sections of the area

TRUE OR FALSE

_____ 1. Several attendants were buried with King Tutankhamen.
_____ 2. Lord Carnavon and Howard Carter excavated Tut's tomb.
_____ 3. Plaster of Paris and wax can be used to help preserve artifacts.
_____ 4. Air causes the decay we see in buried items.
_____ 5. Pieces of pottery are one of the most indestructable artifacts.
_____ 6. The Carbon 14 method of dating is not accurate beyond 10,000 years.

FILL IN THE BLANK: Use the following words to fill in the blanks below. Some words will not be used, so choose your words carefully.

Ur	9	engineering	animal
Egyptians	polytheism	wheel	Upper Egypt
American Indians	agriculture	man	Lower Egypt
Hot/dry	pottery	Ka	writing
30	cold/set	Ba	King Tut
domestication of animals		arch	
math	bone	stone	
4	70		

1. _____ made heaven a watery place.
2. _____ believed the land was no more able to be sold than the wind.
3. A climate must usually be _____ and _____ to preserve ancient remains.
4. There were _____ levels between the body of King Tut and the burial chamber.
5. _____ and _____ are two items which will not decay.
6. The best example of Egyptian culture comes to us from the tomb of _____.
7. _____ and _____ were two inventions of the people of _____.
8. The Egyptians believed that the spirit or _____ lived after the death of one's body.
9. The process of mummification took _____ to complete. (period of time)
10. The pyramids of Egypt are found in the area known as _____.
11. Egyptian gods and goddesses were drawn to resemble a combination of _____ and _____.
12. _____ is a belief in many gods.
13. What change in living conditions do anthropologists suggest caused the change from the old Stone Age to the new one? _____

SHORT ESSAY ANSWERS: Answer the follcwing

1. What is the difference between anthropology and archaeology?

_____

2. List one of the three reasons, Prof. Higbee gives in the chapters, why the American Indian could have followed his lifestyle for many years to come.

_____

3. List one reason for the success of the city of Ur.

_____

4. List one thing used as a defense measure by the people of Jericho.

_____

5. The Kalahari Bushmen treats his environment well because.....(give at least 3 examples)

_____

_____

_____

WRITE THE CORRECT WORD

ROGACEAOLGY _____

CEUMHNETLENSREOIMC _____

OPLGAHRTONYO _____

RCGACDIONBNTA _____

MORE TRUE AND FALSE:

_____ 1. Abu Simbel is a pyramid.

_____ 2. We are able to study archaeology by the fact that new houses are usually built on the leveled remains of old ones in the Middle East.

_____ 3. A domesticated animal is an animal that has not been tamed.

_____ 4. Thermoluminescence is the dating process used on human bones.

_____ 5. In using the method of tree ring dating, archaeologists can only tell when the tree was cut down.

_____ 6. Pollen samples are not useful to archaeologists.

_____ 7. The Bronze Age existed for a period of thirty (30) years.

_____ 8. King Tut's father changed the religion from polyotheism to monotheism.

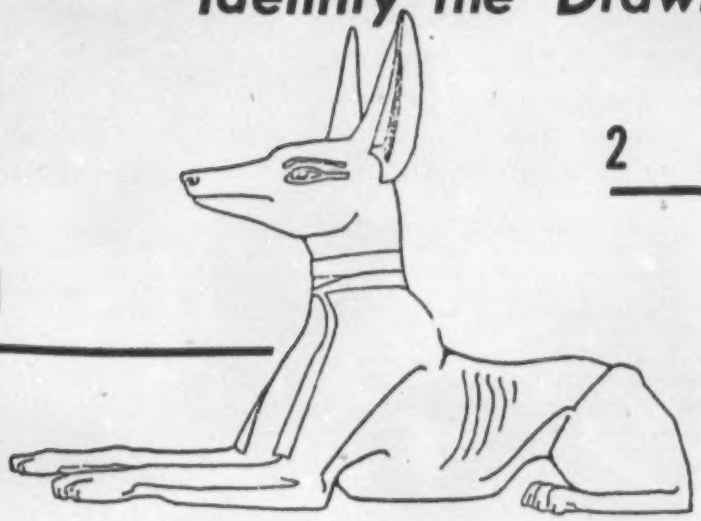
_____ 9. Hiratic is a form of Egyptian writing found on the Rosetta Stone.

_____10. There were no demons (devils) in the Egyptian religion.

_____11. An archaeologist is never an anthropologist.

Identify the Drawings

1 _____



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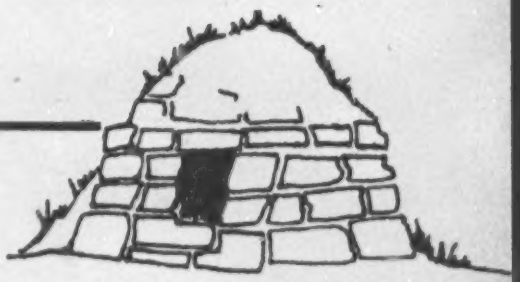

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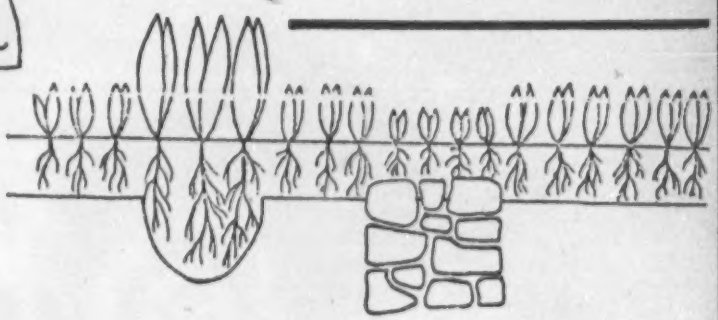
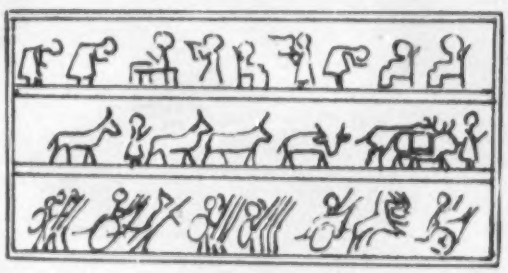
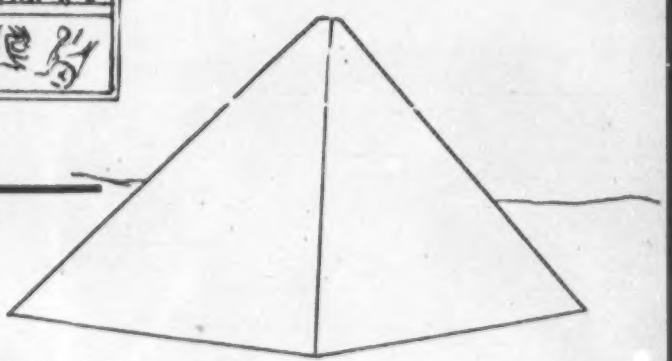


4 _____

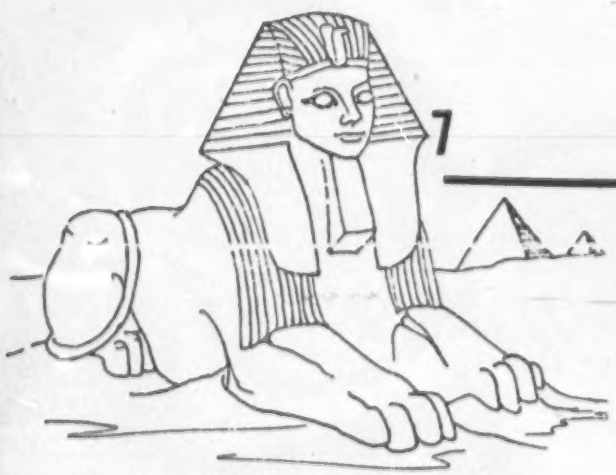
5 _____



6 _____



7 _____



8 _____